

BRITISH SEA FISH.



An ILLUSTRATED
HANDBOOK of the
EDIBLE FISHES of
the BRITISH ISLES

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(Society of Edinburgh)

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BRITISH SEA FISH

An Illustrated Handbook
of the Edible Sea Fishes
of the British Isles .

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Preface.

The object of this essentially elementary handbook is to provide illustrations and brief descriptions of the several kinds of marine fishes which are marketed in this country in appreciable quantity as articles of commerce, and in a minor degree to give an added interest to those perchance inexperienced sea-fishermen who wish to be able to recognise at a glance the various forms of fish which come under their notice, or fall victims to their bait whilst engaged in a form of sport dear to the heart of every Briton who takes pleasure in the sea and can endure its varying moods. The work has been founded largely upon the lines of others which have appeared of recent years in those maritime countries of Europe in which fish forms an all-important article of diet, and is to be regarded as in no way scientific.

It is a well-known fact that although the supply of certain *species* of fish with which almost everyone is familiar, as for example Plaice, Turbot, Haddock, Halibut, and Brill, has been for years past steadily on the decline, yet there has been a corresponding increase in the total *quantity* of fish landed in the British Isles during the same period. An examination of the statistics of the Board of Agriculture and Fisheries not only makes this clear, but shows further that with the decrease in supply of those species of better-known edible qualities, there has been an undoubted increase in the supply of others less secure in public favour, and that these have been marketed with greater frequency and in larger quantities.

There can, however, be but little doubt that while this condition has been slowly but surely demonstrating itself in the stock-in-trade of the ordinary fishmonger, the public mind has undergone but little or no change so far as the selection of what are technically known as "wet fish" is concerned. This is especially noticeable in inland towns, where the occasional supplies of comparatively unknown but excellent fish for food purposes command practically

no sale owing to the fact that public appreciation is lacking, and that the vendor is unable to convince his customers of the good quality of his wares. In such localities it is no uncommon occurrence to see such valuable species as Red and Grey Mullet, John Dory, Grey Gurnard, and others, offered at a price which can be but slightly above the cost entailed in bringing them to market.

Another point which may, to a certain degree, account for such conservatism of taste lies in the fact that certain varieties of fish suffer less at the hands of a poor cook than others, and the customer naturally looks with favour upon those which in process of cooking are not rendered unpalatable in the kitchen of the ordinary middle-class household. The proper preparation of fish for the table undoubtedly requires the exercise of a certain amount of skill, but it is an art easily acquired, and once mastered it can render even what are regarded as inferior varieties both wholesome and palatable. The great demand and almost universal advance in price generally which has occurred within the last few years is to be largely accounted for by the growing popularity of fish as an article of diet amongst the working classes, as indicated by the material increase of the fried-fish trade—a trade which fulfils a doubly utilitarian object in not only providing wholesome food at a modest cost to the masses, but also in finding an outlet for certain kinds of fish which, owing solely to popular prejudice, were until recently a drug upon the market.

But there is every prospect that in years to come many of the species which are now so utilised will of necessity form part of the usual stock of the ordinary fishmonger, and it is with a view to familiarising the reader with the appearance of such varieties, in addition to those better known, and giving as far as possible a just appreciation of their edible qualities, that the present small volume has been compiled.

The illustrations have in all cases been reproduced from photographs of the actual fish.



Introduction.

METHODS OF COMMERCIAL FISHERY.

From a general standpoint all marketable sea fishes are regarded as belonging to one or the other of two classes, viz.: Pelagic and Demersal. Broadly speaking Pelagic fishes are those that live at various depths, whereas Demersal fishes spend the greater portion of their lives on the sea bed.

The pelagic species with which we have to deal are not numerous, but they comprise the Herring, Mackerel, Sprat, and Pilchard, all of which are of the highest commercial importance. These are often described as "drift-fishes" on account of the fact that for a certain period of the year they frequent the drift, or upper strata of the sea, feeding largely upon the minute animal and vegetable life to be found in such open water. Until of comparatively recent years, the term "trawl fish" was applied solely to demersal fishes, but nowadays, notably in the North Sea, comparatively large numbers of Herring and Mackerel are also caught on the bottom by means of the trawl. During the period of their inshore migration, however, pelagic fishes are chiefly caught in "drift-nets," i.e., nets suspended vertically from the surface of the water, in which the fish become enmeshed behind the gill-covers in swimming against the current, by means of "seines," i.e., nets operated in such a way as to enclose an observed shoal, and by other less familiar methods.

Demersal fishes, on the other hand, are caught commercially almost entirely in two distinct ways, namely trawling and long-lining. The trawl varies in size and method of construction largely in accordance with the type of vessel from which it is used, but in general principle it consists of a bag of netting, fitted with bridles which enable the whole to be towed over the bottom by means of a single rope. The chief difference in construction lies in the method adopted for keeping the mouth open under water. The smaller sailing craft are generally supplied with a "beam-trawl," in which this is effected by

a beam of certain length supported on a pair of runners which glide over the sea bed. The "otter trawl," which has a considerably greater span, is generally carried by steam trawlers, and in this type of gear the mouth of the trawl is opened by the action of a pair of solid runners (otter boards), which are attached to the bridles in such a way that their resistance to the water causes a continuous outward strain on the otherwise collapsible mouth.

It is obvious that a trawl can only be used on ground that is comparatively free of rocks, etc., and in consequence the greater proportion of the trawlers' catch consists of certain kinds of demersal fishes which habitually frequent the sand and shingle. Of these the most notable are Haddock, Whiting, Soles, Plaice, Turbot, Brill, Cod, Hake, Ling, Catfish, and others, although certain of these species have a liking also for rocky ground, and are taken in such areas by the line fishermen.

Generally speaking, the long-liners, *i.e.*, vessels carrying lines baited with a large number of hooks, work in deeper water than do the trawlers, and secure catches of larger fish, but limited to a small number of species, *e.g.*, Cod, Ling, Tusk, Conger, Halibut, Skates and Rays, &c.

But whereas long-lining may be carried out at almost any reasonable depth, the trawlers seldom work in water beyond 110 fathoms. The usual fishing grounds frequented by British vessels are determined largely by this fact, since the extensive use of steam nowadays renders distance a matter of minor importance in comparison with that of securing profitable catches.

FISHING GROUNDS.

For statistical purposes the fishing grounds are divided up into eighteen areas, covering a total extent of 678,900 square miles. These include the waters of the White Sea, Iceland, West of Norway, the Faroes, Rockall Bank, Baltic Sea, North Sea, English Channel, Irish Sea, and the adjacent waters, parts of the Bay of Biscay, and down to the 100-fathom line off the coasts of Spain, Portugal, and Morocco.

The quantity of fish landed annually at the East Coast ports has amounted of recent years to roughly 7/9ths of the entire supply, and a very large proportion of this is derived from the North Sea itself.

In each of the several fishing areas or regions there are, generally speaking, certain predominant species which remain fairly constant, whilst fluctuating in comparative abundance in successive years. Thus in the North Sea the most important demersal fishes are Haddock, Cod, Whiting, and Plaice; in the more open waters of the Atlantic, off Iceland, the Faroes, and Rockall, Coalfish and Catfish; whilst in the White Sea by far the most important species is Plaice, although both Haddock and Cod are well in evidence. From the West Coasts of Scotland and Ireland, *i.e.*, roughly between latitudes 56° and 35° , to the Moroccan Coast, the principal catch consists of Hake, which at the most southern area has amounted of recent years to as much as 75 per cent. of the total quantity of fish taken in the trawl. As regards the English Channel, the western half affords the most profitable fishing grounds, but of recent years there has been virtually a plague of Dogfish, the several species described under this name constituting the predominant feature, and amounting to as much as 20 per cent. of the entire catch, which in this area is otherwise rather varied.

GROWTH OF THE FISHERIES.

The more extensive use of steam vessels for trawling, long-lining and drifting, the greater advantages derived from the use in some form or another of cold storage and increased railway facilities, together with the system prevalent in certain areas of direct transport from the fishing fleet to market, are the more important factors which have conspired to bring about an almost startling increase in the quantities of wet fish landed in this country within the last quarter of a century.

The Government statistics clearly show that during this period the landings have risen by about 90 per cent., but it is to be regretted that this increase is largely due to the greater quantity of pelagic fish, notably herring, whilst the landings of certain demersal fishes of the highest commercial importance show a more or less steady decline.

When it is remembered that the herring fishery derives its greater importance as forming the subject of an extensive export trade, it will be seen that from the home consumer's standpoint this material increase is not a matter of advantage to this country.

VALUE OF THE FISHERIES.

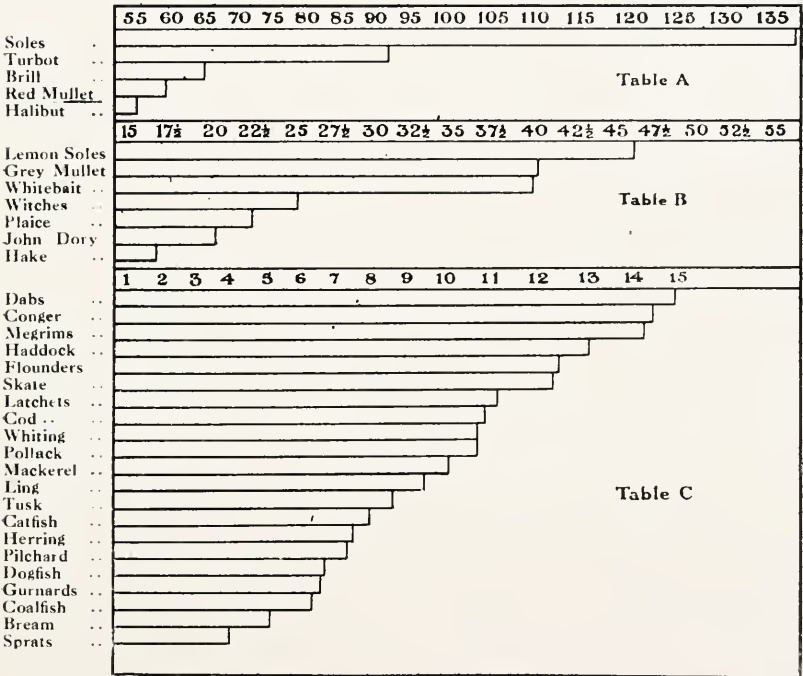
For although the total value of the fish (other than shell-fish) landed in these islands in the year 1913 exceeded, according to the Government statistics, a sum of £10,000,000, and surpassed the record of any previous year by a matter of £1,126,000, we gather from the same source an impression of the steady increase of prices of the well-known varieties of demersal fishes which meet with universal demand, a fact which has a bearing upon the matter discussed in a previous paragraph.

There is a certain interest attached to the record values of catches made by commercial fishing vessels, and it may be mentioned that during the European War, in January, 1915, a sum nearly approaching £4,000 was realised upon a catch of Plaice from the White Sea made by a Hull trawler in three weeks' fishing, a figure unprecedented for a trawler's catch, but made, of course, during what was virtually a fish famine.

COMPARATIVE VALUES OF VARIOUS KINDS OF FISH.

The following table has been compiled from an examination of the market reports extending over several years. The numerical factors, however, have no significance so far as the retail prices of fish are concerned, and are here used solely for purposes of comparison. Undoubtedly the most remarkable feature lies in the high value of Soles in comparison with that of other prime fish. The varieties of medium and low value appear to commence with Witches, the cost of these falling far below that of White-bait, but in the species immediately following it seems that value cannot be taken altogether as a criterion of quality. One has necessarily to take into consideration the abundance or paucity of supply of each individual species, and it is interesting in this connection to note the comparatively low price of Cod and Whiting against that of Hake. The periodicity of abundant landings in the case of all the pelagic fishes naturally explains the fact of the low price of such species as Mackerel, Herring, and Sprat, and anyone who has noted the profuse supply of the last-named during its brief season, can fully understand the reason why it holds the lowest place on the list. It is certainly more difficult to find cause for the comparatively slight value of Sea-bream, unless it be due to a certain popular idea that the species included under the name are of a questionably wholesome nature.

Table showing the Comparative Values of the principal Marine Fishes.



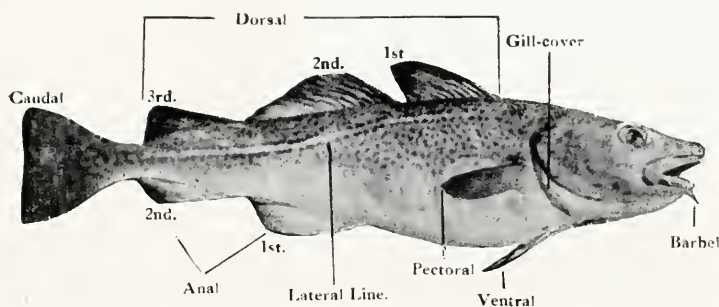
NOTE :—In the examination of the above it should be noted that *three different series* of numerals, given as an indication of value, are employed in the Tables marked A, B and C. If the significance of this fact be borne in mind the two lower Tables may be read in continuity to the upper one.

Table showing the average quantity of each kind of fish landed annually in England and Wales during the period 1906-1913.

	Cwts.
Herrings	4,722,472
Haddocks	2,264,879
Cod	2,249,999
Plaice	906,991
Hake	736,235
Skates and Rays.....	375,953
Mackerel	358,788
Whiting	327,850
Coalfish	277,935
Ling	208,649
Halibut	155,772
Dabs	106,870
Gurnards	99,700
Megrims	91,998
Pilehards	86,693
Catfish	82,601
Bream	79,126
Soles	64,923
Sprats	64,371
Turbot	61,643
Lemon Soles	53,989
Conger Eels	50,335
Monks (Anglers)	36,524
Dogfish	34,170
Witches	33,661
Tusk	21,865
Pollack	19,877
Brill	19,722
Whitebait	6,618
Flounders	6,073
Latchets	2,990
Dory	2,531
Grey Mullet	847
Red Mullet	431

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Ling	7	Plaice	23
Tusk	7	Flounder	24
Hake	8	Dab	25
Catfish	9	Witch	26
Conger	10	Megrim	27
Grey Mullet	11	Herring	28
Red Mullet	12	Pilchard	29
Gurnards	13	Sprat	30
John Dory	14	Mackerel	31
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No. 1. COD.

Gadus morrhua, Linnæus.

Also occasionally *Gadus narvaga*, Koelreuter, and *Gadus saida*, Lepech, from Northern waters.

Usual extreme length: $4\frac{1}{2}$ to 5 feet. Chiefly marketed at about 3 feet.

Description: Body heavily built in the fore part and tapering fairly abruptly to the tail; first anal fin commencing beneath the fourth or fifth ray of the second dorsal; a long fleshy barbel situated on the lower jaw. Coloration greenish-yellow or olive, with numerous dark spots, shading off to impure white below; lateral line white and fairly conspicuous.

The Cod spawns from January to June; its food consists of crustaceans, molluscs and young fish.

Range:—From the North of Norway and Iceland to the Bay of Biscay, and from Greenland to New York.

Remarks:—The Cod, the young of which is known as the Codling, is one of the most important food-fishes of Europe and North America in the fresh state, whereas in a salted or dried condition it is extensively marketed in various other parts of the world. The chief fishery is carried on by steam trawlers and long-liners off Newfoundland and Iceland, in the North Sea, to the West and North of Scotland, and off the West Coast of Norway.

Extensive use is made of the liver for the extraction of medicinal oil, but this commodity is now in far less demand than in former years. Smoked Cod's roe is esteemed by many as a delicacy, and large quantities of Codling are prepared and sold as "Smoked Haddock."

In a fresh state the Cod almost invariably forms part of the ordinary stock-in-trade of the fishmonger; it is a fish eminently suitable for boiling in large pieces, for frying in cutlets and fillets, or when of small size (Codling), baking entire with seasoning.

Note.—As it is necessary, for purposes of description, to refer to certain details of the external characteristics of fishes in general, the above illustration has been labelled with a view to indicating the position of such features in the case of the Cod. The modification, development, or lack of the several fins, etc., may be traced in all the species described in this volume, with the exception of the Dogfish, Skates, and Rays, in which a somewhat different form of structure is present.



No. 2. HADDOCK.

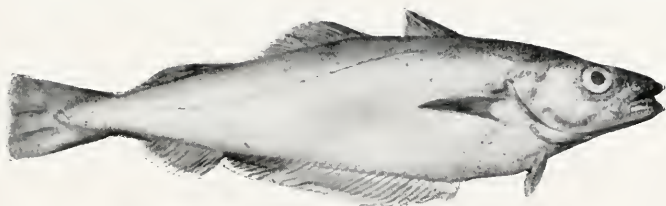
Gadus aeglefinus, Linnæus.

Usual extreme length :— 25 inches, but examples have been recorded measuring 3 feet.

Description :—Body more slender in build than that of the Cod, the lower jaw not so prominent; barbel of small size; first anal fin commencing almost on a level with the second dorsal. Coloration on the back and sides bronze green, shading off to an impure white; usually a conspicuous black blotch below the middle of the first dorsal fin; lateral line black. The Haddock spawns in the early months of the year; its food consists of molluscs, crustaceans, sea urchins, worms, etc.

Range :—From the North of Scandinavia and Russia to the Bay of Biscay. The Haddock is very abundant in the northern part of the North Sea, on the West Coast of Scotland, and around Iceland, but is not common in the English Channel.

Remarks :—Of the Cod family, the Haddock is second only to the Cod in commercial importance, its market value being higher than that of its larger ally. In the trade three distinct categories of size are generally recognised "Large" about 2lbs. to 3½lbs. in weight, "Medium" about 1½lbs., and "Small" or "Chat Haddocks" ¾lb. or less. The highest proportion of large fish comes from Iceland, in which the weight distinction ranges somewhat higher, but the North Sea is responsible for the heaviest landings. The Haddock in a "wet" state is a table fish of excellent quality, but from the commercial standpoint the species is of greater importance as forming one of the staple products of the dried fish trade, smoked haddock being in universal demand.



No. 3. WHITING.

Gadus merlangus, Linnæus.

Usual extreme length:—18 inches.

Description: Body comparatively slender in build; first anal fin commencing on a level with the middle of the first dorsal; lower jaw shorter than the upper, and bearing no barbel. Coloration greyish yellow, with yellow stripes along the silvery sides; a shoulder spot situated above and around the base of the pectoral fin.

The Whiting spawns from March to May; its food consists chiefly of small fishes, crustaceans, etc.

Remarks: The Whiting is rather more coastal in its distribution than either the Cod or Haddock. As a food fish it is remarkable for its delicate flavour, on that account being invaluable for the diet of invalids. Of the total quantity of Whiting landed in Britain, nearly three-quarters are derived from the North Sea. In common with the two preceding species, this fish is often smoked and retailed as "Haddock."



No. 4. WHITING POUT, POUTING.

Gadus luscus, Linnaeus.

Usual extreme length :— 16 inches.

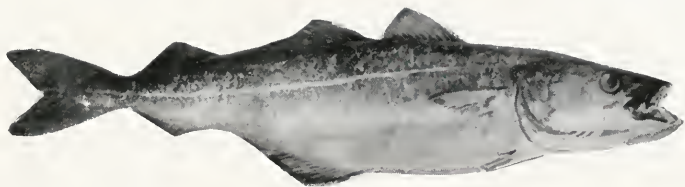
Description :—Smaller than the Haddock, and proportionately much deeper in the body. Coloration dark brown above, shading off to impure white on the lower parts; broad vertical bands at intervals down the flanks.

Range : Commonly distributed around Britain, very abundant in the English Channel, frequenting coastal waters.

Remarks :—Although well known to the sea angler, the Pout is not marketed in any appreciable quantity in this country, but occasional examples are found amongst consignments of Whiting, to which species, both as regards flavour and quality, it very nearly approximates.



A smaller species, the Poor Cod, or Power—*Gadus minutus*, Linnaeus (see figure)—which somewhat resembles the Pout, but lacks the vertical bands, is sometimes met with amongst lots of “mixed fish.”



No. 5. COALFISH, GREEN COD, *ROCK SALMON, SAITHE.

Gadus virens, Linnaeus.

Usual extreme length:—3 to 4 feet.

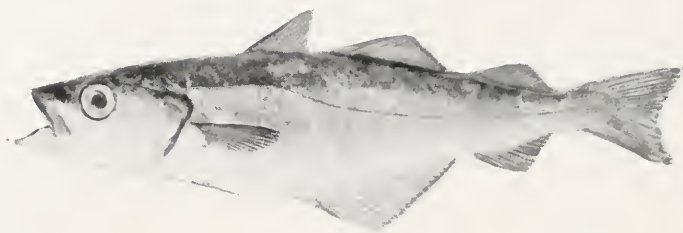
Description:—Body of moderately robust proportions, gently tapering to the tail; lower jaw slightly longer than the upper, and bearing a barbel of small size; first anal fin commencing below the last few rays of the first dorsal. Coloration above, very dark greenish blue, almost black, shading off to impure white on the flanks and lower parts; lateral line white and fairly distinct.

The Coalfish spawns from January to April; its food consists of molluscs, crustaceans, and other fishes.

Range:—From the North of Europe to the Mediterranean; in British seas the species is most abundant off the Scottish coasts.

Remarks:—The quantity of Coalfish marketed annually has shown a material increase of recent years, but the value has remained fairly constant. It is a fish of rather poor flavour and quality, and on that account not frequently to be met with at the ordinary fishmonger's in a wet state, but is one of those species largely used by the frying trade, and may often be seen on fish stalls in poor localities. The flesh is liable to somewhat rapid deterioration. Sea anglers in Scottish waters cannot fail to be struck by the enormous shoals of young Coalfish (*Cuddies*, *Podleys*, etc.) to be met with in estuaries, harbours, and other inshore waters, where they are fished for, by young and old, by means of a primitive white fly attached by a short line to a long cane or other thin pole.

* The term "Rock Salmon" is also applied to the Catfish.



No. 6 POLLACK, LYTHER, etc.

Gadus pollachius, Linnæus.

Usual extreme length:—3 feet.

Description:—Somewhat similar to the Coalfish, but readily distinguishable from that species by the following characteristics:—lower jaw more protruding; the body proportionately deeper in comparison with length; no barbel; coloration distinctly greenish, instead of blue-black or black, with bronze reflections on the sides; lateral line not so conspicuous as in the Coalfish.

The Pollack spawns from March to June; its food consists largely of other fishes in the case of the adult, the young subsisting chiefly on small crustaceans, molluscs, marine worms, etc.

Range:—From Scandinavia to the Mediterranean. Although the Pollack occurs everywhere around the British Isles, it appears to be the southern equivalent of the Coalfish, being found most commonly off the coasts of Devon and Cornwall.

Remarks:—At least forty local names are known for this species, and in the North of Scotland and off the Irish Coast it is often confused with the Coalfish. The quantity of Pollack landed by commercial fishing vessels is inconsiderable in comparison with that of Coalfish, but the market value is much higher. The Pollack is essentially a sea-angler's fish, affording good sport to the line fisherman in the vicinity of weed-covered rocks. The flesh, moreover, both in quality and flavour, is far superior to that of the Coalfish, but equally liable to rapid deterioration. It is on this account seldom sold retail outside the ports of landing. When quite fresh from the sea and fried in fillets, or cut into small pieces and served as "mock whitebait," it is an excellent table fish.



No. 7. LING.

Molva vulgaris, Fleming.

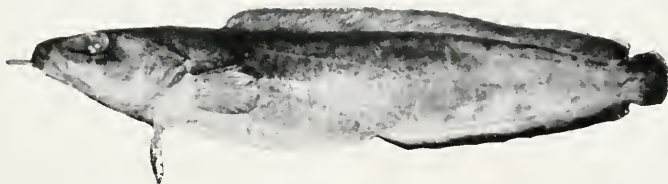
Usual extreme length:—4 to 6 feet.

Description: Body attenuated, invested in a tough skin bearing small scales; head smaller in proportion to the body than that of the Hake; several large teeth in the lower jaw and palate; barbel of fair length; first dorsal fin short and rounded, followed by a second continuous to within a short distance from the tail; anal fin commencing below the seventh or eighth ray of the second dorsal. Coloration grey above, shading off to impure white on the lower parts, occasional specimens showing large black spots; dorsal, caudal, and ventral fins, edged with white.

The Ling spawns from March to June; it preys almost entirely upon other smaller fishes.

Range:—From the White Sea and Newfoundland to the Bay of Biscay. The species is more abundant to the north of Britain.

Remarks:—A food fish of very fair edible quality, excellent when fried in cutlets, and very suitable for salting or pickling.



No. 8. TUSK, TORSK, CATFISH, MOONFISH.

Brosmius brosme, Ascanius.

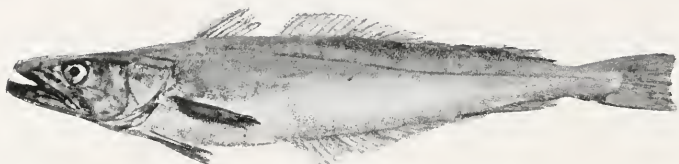
Usual extreme length: 36 inches, but the majority of specimens seldom exceed half this length.

Description: Body almost circular in section, and wholly invested, including the fins, with a thick and tough skin; the single dorsal fin continuous to the base of the tail, the anal being similar in this respect, and commencing below the 35th or 36th ray of the dorsal; scales of small size, and deeply imbedded in the skin; a barbel present in the lower jaw. Coloration above, grey suffused with yellow, this lighter shade being more pronounced on the margins of the fins.

The Tusk spawns from April to June; its food consists of crustaceans and small fish.

Range:—From the White Sea to the Northern area of the North Sea. The species is fairly abundant off the Shetlands and Faroes, its distribution extending to fairly deep water.

Remarks:—In quality and flavour the Tusk is very similar to the Ling, the market value being practically the same. About 20,000 cwts. are marketed annually.



No. 9. HAKE.

Merluccius vulgaris, Fleming.

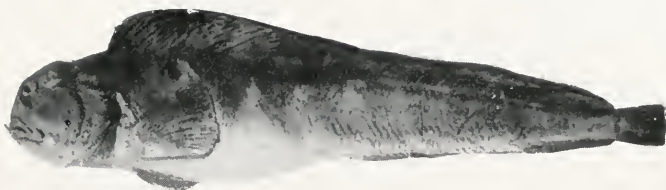
Usual extreme length:—4 feet, but the majority of examples marketed seldom exceed 3 feet.

Description:—Body somewhat attenuated; head and mouth of fair size, the jaws armed with double rows of sharp, pointed teeth, others occurring on the palate; first dorsal fin short and almost triangular, followed by a continuous second dorsal extending to a short distance from the tail; anal fin commencing below the third ray of the second dorsal. Coloration dark cinereous grey above, lightening on the sides and belly; interior of the mouth and gill-covers black.

A deep-water and migratory species. The inshore movements of the Hake are very largely determined by those of its prey, *e.g.*, pelagic fishes such as Herring, Mackerel, Pilchard, etc. The spawning period extends from March to June.

Range:—From Norway to the Canary Islands, and throughout the Mediterranean. The species is more abundant on the South-West and extreme West of Britain than in the enclosed waters of the Irish Sea and Southern North Sea.

Remarks:—The Hake is a table fish of excellent medium quality, the flesh being firm and not liable to rapid deterioration. One of the best methods of cookery is by frying in cutlets. Hake is also excellent for the preparation of fish cakes, and for pickling in spiced vinegar.



No. 10. CATFISH, SEA WOLF, ROCK SALMON.

Anarrhicas lupus, Linnaeus.

Usual extreme length :—6 feet.

Description:—Body somewhat attenuated, invested with a tough skin; scales rudimentary; a continuous dorsal fin extending throughout the greater part of the body; breast fins large and rounded; ventral fins absent; jaws furnished with long curved teeth, which project prominently on the lower jaw; two rows of grinding teeth on either side, three rows on the roof of the mouth. Coloration bluish grey above, lightening considerably on the flanks and lower parts, a row of dark bars passing down the back.

The Catfish spawns in winter. Owing to the possession of such an admirable dentition, this fish is able to crush the shells of such powerfully protected molluscs as the Whelk, upon which amongst other shellfish it very largely feeds.

Range:—An essentially Northern fish, occurring from Greenland to the North Sea, and off the American Coast to Cape Hatteras.

Remarks:—The greatest supply of Catfish comes from Iceland, and about 160,000 cwts. are marketed annually in this country. The market value has shown a material increase within the last few years, the species now forming part of the usual stock-in-trade of the fishmonger. In common with the Angler, and certain other species of equally forbidding appearance, the Catfish is never exposed for sale in an intact condition, but is prepared by skinning and filleting, and generally sold under another name.

The flesh is of very fair quality, eminently suitable for boiling or frying in cutlets or filets.

The name "Rock-Salmon," by which the Catfish is usually described in the retail trade, is also applied to the Coalfish.



No. 11. CONGER EEL.

Conger vulgaris, Cuvier.

Usual extreme length :— 8 to 9 feet.

Description :—Eyes and head larger in proportion to the body than they are in the Common Eel. Dorsal fin commencing at a point close behind the pectoral fins, and coalescing with the caudal and anal. Gill-openings of large size; teeth situated so closely together as to form a cutting edge. There are no scales, but the skin is firm and tough. Coloration dark olive brown, lightening on the flanks and lower parts to an impure white; in many specimens taken from sandy ground the general tone is much lighter; the margins of the fins are black.

The food of the Conger consists of other fishes, including smaller individuals of its own kind, squid, cuttlefish, crustaceans, etc.

Range :—From the coasts of Europe, including the Mediterranean, to sub-tropical seas. Off Britain the species is most abundant in the English Channel.

Remarks :—From the natural scientific standpoint, the Conger is of considerable interest, chiefly on account of the remarkable metamorphosis which is undergone by the developmental stages of the young. The larval form, the so-called "*Leptocephalus*"—a flattened, transparent creature, quite unlike the adult—was at one time regarded as a distinct species. The flesh is of very fair quality, equally suitable for boiling or frying in cutlets or fillets. The young fish may be cooked in the same way as the Common Eel.



No. 12. GREY MULLET.

Mugil capito, Cuvier.

Mugil chelo, Linnæus (see figure).

Usual extreme length : 3 feet, but the majority seldom exceed 18 inches.

Description :—The term “ Grey Mullet ” is applied to two species of fish, which differ chiefly in the fact that in the one the lips are thick and in the other thin ; otherwise the following description of external characters may be attributed to either. There are two dorsal fins, the first consisting of four well developed spinous rays, and the second of one spine and eight or nine soft rays ; the anal comprises eight to ten rays, and there are a spine and five rays in the ventral fin. The dorsal fins are comparatively far apart, and the tail is large and slightly forked. The coloration is silvery grey, darker on the back, interrupted on the flanks by rows of almost black strokes.

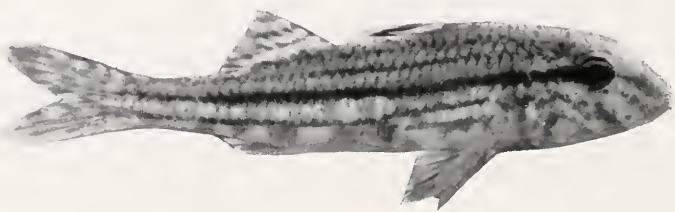
Grey Mullet are gregarious, and feed largely upon vegetable matter.

Range :—The thick lipped species (*M. chelo*) is of fairly general occurrence around our coasts, being met with more frequently to the south of Britain. The other is probably of very similar range, but is generally considered to be scarcer. Both species occasionally frequent brackish and even fresh water.

Remarks :—The quantity of this excellent table fish landed of recent years has been steadily on the decline. The fishery is very irregular, being carried on chiefly by means of seines, shot in close inshore waters.

Although great similarity in flavour undoubtedly exists between the two species, the Grey Mullet bears no real affinity to the Red Mullet, which is, zoologically speaking, an entirely different type of fish.

The best method of cookery consists in baking the entire fish, with seasoning, in an envelope of greased paper.



No. 13. RED MULLET.

Mullus barbatus, Linnæus.

Mullus surmuletus, Linnæus.

Usual extreme length :—15 inches.

Description :—The term “Red Mullet” is applied to two species of fish, which differ too slightly to be distinguished in the market. In both the body is rounded and covered with large scales; the two dorsal fins are fairly short, the first weakly spinous and the second soft; the anal fin commences immediately below the second dorsal. The head is of comparatively large size, the eyes conspicuous, and the mouth situated on the under surface. The lower jaw is furnished with a long stiff barbel, which can be erected at will, and assists the fish in its search after food on the bottom, this consisting of small crustaceans, worms, etc. The coloration is very pleasing, consisting in *M. surmuletus* of varying shades of red, interspersed with three to five yellow streaks passing down the sides. The second species may be distinguished from its larger ally by the absence of these bands.

The Red Mullet spawns during the summer.

Range :—From Norway to Teneriffe, and throughout the Mediterranean. The Red Mullet is nowhere abundant in British seas, but is chiefly met with off the South and West coasts.

Remarks :—The Red Mullet has been held in high esteem as a food fish certainly from Roman times, numerous references occurring in classical authors of the sale of large examples at fabulous prices.

Of recent years the quantity marketed in this country has been very slight, a matter of a few hundred cwts.

The Red Mullet possesses a characteristic flavour which gives it a unique position amongst edible fishes; it is popularly known as the “Woodcock of the Sea,” on account of the usual method of cookery, which consists in baking the fish entire without removing the entrails.

In the market, the real beauty of this elegant species cannot be appreciated, owing to the inhumane practice prevalent among fishermen of de-scaling the fish alive in order to fix the characteristic colour.



No. 14. GURNARDS or GURNETS.

Tub, or Latchet, *Trigla hirundo*, Bloch (see figure).

Piper, *Trigla lyra*, Linnæus.

Grey Gurnard, *Trigla gurnardus*, Linnæus.

Red Gurnard, *Trigla cuculus*, Linnæus.

Streaked Gurnard, *Trigla lineata*, Linnæus.

Long-finned Gurnard, *Trigla obscura*, Linnæus.

Usual extreme length :—24 to 26 inches for the first three species, 12 to 18 for the others.

Description :—Despite numerous specific differences, all the Gurnards agree in the following characteristics :—Bones of the head devoid of soft skin, and developed to form a hard integument; strong spines present on the gill-covers; three rays of the breast fins separated, forming finger-like appendages which assist the fish in their search after food; first dorsal fin supported on spines, the upper ends of which project; second dorsal, and anal, composed of soft rays. The coloration of all the species, with the exception of the Grey Gurnard, is red or reddish brown, lightening off to pure white on the underparts. The breast fins of the Latchet are very beautiful, being of a brilliant sapphire blue, speckled with black. All the Gurnards have a curious habit of emitting a grunting sound when removed from the water.

The food consists largely of crustaceans, together with occasional small fish, molluscs, etc.

Range :—The Latchet, Grey and Red Gurnards, with certain limitations, occur from Norway to the Mediterranean, being met with more abundantly to the South of these islands. The Grey Gurnard is the most northern in distribution, occurring fairly abundantly in the North Sea. The other species enumerated are almost exclusively southern.

Remarks :—In the market the term “Gurnard” is generally applied to the Grey variety, though other species are often included. Latches are separately distinguished, their value being nearly twice as high as that of the former. By many the Grey Gurnard is esteemed above all others. Despite their comparatively low price, all the species are of very fair quality, but they are fish more suitable for frying or baking than for boiling.



No. 15. JOHN DORY, DORY.

Zeus faber, Linnæus.

Usual extreme length :—20 inches.

Description: Body considerably compressed on the sides; head and mouth of large size, the latter being capable of much protrusion when open; rows of spines along the bases of the dorsal, and second anal fins, ten spinous rays in the first portion of the dorsal fin, twenty-two or twenty-three soft rays in the hinder part; the anal fin divided into two distinct sections, the first consisting of four spines, and the second of twenty-one to twenty-three soft rays. Filaments occur at the tips of the dorsal spines, and the ventral fins are of considerable length. The coloration in life is yellowish grey, with wavy bands of a lighter shade, and a conspicuous black spot, edged with yellow, on the centre of each side.

The Dory spawns from the end of May to August; its food consists chiefly of living fishes, such as sand-smelts, rocklings, etc. These are stalked in the most leisurely fashion by the Dory, which relies solely upon its slender anterior outline as a means of approaching to a convenient striking distance of its prey without being observed.

Range:—From the coast of Norway to Madeira, and throughout the Mediterranean. In British waters, the Dory is chiefly to be met with in the English Channel and Bristol Channel; in the North Sea the species is comparatively rare.

Remarks:—The Dory is a table fish of excellent quality, commanding a fairly high price in the London market. Curiously enough, however, a certain prejudice exists against the species, due to the fact of its somewhat grotesque appearance. The popular name "John Dory" is derived from the French words *jaune dorée* (golden yellow), in reference to the colour.

Like many another fish possessing little depth of flesh, the present species is not suitable for boiling, but is excellent for frying or baking in the method described for Grey Mullet.



No. 16. NORWAY HADDOCK, BERGYLT.

Sebastes norvegicus, Ascanius.

Usual extreme length :—4 feet, but the majority of examples marketed seldom exceed half this measurement

Description :—Body somewhat stout in build ; head massive, and spiny in the region of the gill-covers. Dorsal fin consisting of fifteen strong spinous rays, and the same number of soft ones ; the anal of three spines and eight or nine other rays. The lower jaw extending beyond the upper, and bearing a protuberant knob at its extremity. Coloration bright red, shading to pink on the flanks and lower parts.

The Norway Haddock is viviparous, producing its young alive ; its food consists chiefly of animal matter.

Range :—This is an essentially Northern fish, its distribution extending from Spitzbergen to the South-West coast of Norway. In English waters the species is comparatively rare.

Remarks :—The Norway Haddock has been included in the present volume largely on account of the fact that of recent years increasing numbers appear to be marketed in Britain by vessels fishing in Northern waters. At present the species is but little known, but it is undoubtedly one of excellent quality and flavour. In the northern Continental markets, however, it meets with a ready sale. A good method of cookery consists in baking the fish entire with seasoning.



No. 17. SEA BREAM.

Pagellus centrodontus, Delaroché (see figure).

Cantharus lineatus, Montagu.

And certain other species.

Usual extreme length:—About 16 inches for both species.

Description:—The term “Sea Bream” is used in the market to describe a number of various fishes belonging to the genera *Pagellus*, *Cantharus*, *Pagrus*, *Sebastes*, etc., but the species mentioned above are those chiefly to be met with in the stock of the ordinary fishmonger.

Both agree in the following characteristics:—Body deep and plump, covered with large scales; head and eye of large size; well developed dorsal and anal fins, the fore part of each supported on powerful spines; canine teeth present in the jaws of *Cantharus*, absent in *Pagellus*.

The Common Sea Bream (*Pagellus centrodontus*) is of an orange scarlet above, more or less silvery on the flanks and belly, and has a large black spot on the shoulder. The reddish tone is not developed until the fish approaches maturity. On the South Coast the young are known as “Chad.”

The food consists of various marine animals, and seaweed.

The Black Sea Bream (*Cantharus lineatus*) exhibits a charming livery of “argent and sable,” with yellowish reflections.

Range:—The Common Sea Bream occurs from Norway to the Mediterranean, and is very abundant in the English Channel. The distribution of the second species is similar, but in British waters it is nowhere so common. Bream approach the coastal waters only during the summer, retiring to greater depths on the approach of winter.

Remarks:—Although exhibiting certain characteristics which would appear to mark them as being food-fishes of high edible quality, *e.g.*, firmness of flesh and excellent flavour, Sea Bream are held in but little esteem, and in the market their value ranges extremely low. This fact is somewhat difficult to account for, but it may be stated that many people consider these fish to be unwholesome. It is known that their food sometimes consists very largely of sea-weeds, but in the absence of any scientific investigation on the matter it is impossible to say whether, as in the case of certain tropical fishes, their flesh acquires at times a slightly poisonous character from the nature of the food.



No. 18. ANGLER, MONK, FROGFISH, SILVER SALMON.

Lophius piscatorius, Linnaeus.

Usual extreme length:—5 to 6 feet, chiefly marketed at 2 to 3 feet.

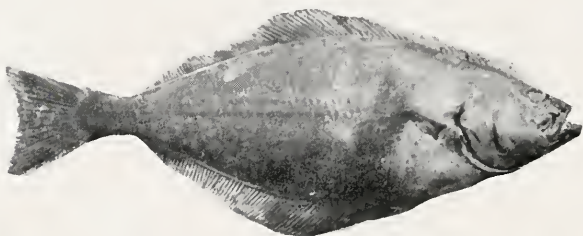
Description:—Body short and rapidly tapering to the tail; head massive, occupying about one-third of the entire length; mouth very wide, the lower jaw longer than the upper, each jaw being furnished with two rows of teeth directed backwards; first dorsal fin consisting of six separated spines, the first situated on the snout and terminating in a conspicuous flap of membrane constituting the “angle”; the rest of the fins invested, for the greater part, in the tough flabby integument which covers the body; eyes of small size; fringed lappets projecting from the skin all round the margin of the body and head; the whole of the fish compressed from above and below. Coloration above, grey, covered with a fine network of dark brown, pure white below.

The Angler spawns from June to August, the ova being deposited in large floating sheets; its food consists of small fishes, which are captured by means of the “angle” already referred to. This feature of the fish’s structure, strictly speaking, belies its name, being in actual fact something in the nature of a sensory organ, which when touched by any object, living or otherwise, causes the fish to snap upward with unerring aim at a point immediately in advance of the tentacle.

Range:—From the Shetlands to the Mediterranean, and from Newfoundland to Cape Hatteras. The species is fairly abundant everywhere around the British coasts.

Remarks:—The name “Monk,” which is chiefly employed at Grimsby, strictly applies to another fish (*Rhina squatina*, Linnaeus), but has probably been adopted as appearing more euphonious than Frogfish, Fishing-Frog, or Sea Devil. The portions marketed consist of the

two broad fillets from the sides of the body. The value has shown a marked increase within the last few years, this being one of those species of fish eminently suitable for the frying trade. The flavour and quality are both moderately good, but popular prejudice would doubtless effectually bar a sale for the species if the Angler were displayed upon the fishmonger's slab in an uncut condition. From thirty-five to forty thousand hundredweights are annually landed in this country.



No. 19. HALIBUT, HOLIBUT.

Hippoglossus vulgaris, Fleming.

Usual extreme length:—6 to 7 feet, but examples have been recorded of 20 feet; the majority marketed seldom average more than 18 inches to 3 feet.

Description:—The largest of all flat fishes, approaching more nearly in shape to a round fish than any other member of the same group; eyes situated on the right side of the body; jaws similar on both sides; skin smooth, the scales being of small size; lateral line fairly conspicuous, exhibiting a sharp upward turn above the pectoral fin. Coloration dark olive brown, with marblings of a deeper tone.

The Halibut spawns from February to May; its food consists chiefly of other fish and crustaceans.

Range:—Essentially a Northern fish, the species does not range farther South than the English Channel, where it is by no means plentiful. The largest supply comes from Iceland.

Remarks:—The Halibut is a table fish of high quality, suitable for any form of cookery. The market value has shown a material increase of recent years, it standing now half as high as that of soles.

Note.—The term "Flatfish," in contradistinction to that of "Round-fish," is used to designate those species in which both eyes are situated on the one side of the head; the dorsal and anal fins are consequently to be seen on opposite margins of the body, when the fish is viewed in the ordinary way. Rays and Skates, in which the trunk is compressed from above and below, although flat fishes in every sense of the word, are not included in this category. The several species of flatfish are known as "right-sided" or "left-sided," according to the normal position of the eyes, but it may be remarked that in their early stages of life the members of this group have the organs of sight situated on both sides of the head. The passing of the eye to the other side of the body, and the assumption of the side-swimming habit, occur while the young are still of small size.



No. 20. TURBOT.

Rhombus maximus, Linnæus.

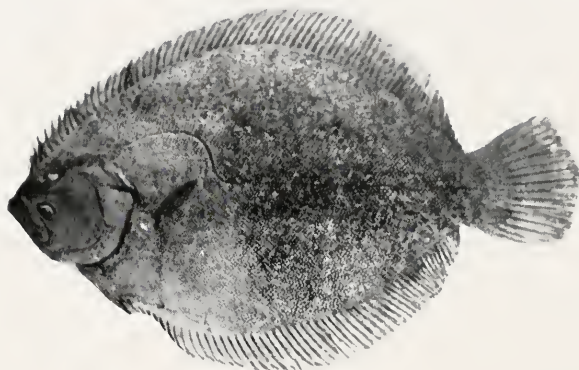
Usual extreme length:—26 inches, the average being 17 inches.

Description:—Body very broad and rounded in outline; eyes on the left side of the head, which latter is large in proportion to the rest of the body; upper and lower jaws equal on both sides; scales absent, their place being taken by numerous scattered bony tubercles. Dorsal fin commencing in advance of the upper eye and comprising sixty-one to seventy-two rays, the anal forty-five to fifty-six. The coloration in life is admirably in keeping with the fish's surroundings, being variously speckled with different shades of brown which harmonise with the general tone of the sea-bed, but this characteristic departs with life, and fish seen exposed for sale are generally dark brown, with inconspicuous mottling.

The Turbot spawns from April to August; its food consists largely of other fishes.

Range:—Essentially a southern fish, the Turbot occurs throughout the Mediterranean and Black Seas, and northward to the South of Scandinavia.

Remarks:—This species is a "prime fish" of excellent quality, second only to the Sole in value and flavour. The greatest quantity marketed in this country comes from the Southern area of the North Sea, but the English Channel also supports a profitable fishery. The Turbot forming the ordinary stock-in-trade of the fishmonger are generally fish of large or medium size, which are cut and retailed in pieces suitable for boiling or frying. Small fish from 1lb. to 1½lbs., known as "Chicken Turbot," "Dover Turbot," etc., are sometimes to be obtained at very moderate price, and are eminently suitable for frying or grilling entire.



No. 21. BRILL.

Rhombus levis, Rondelet.

Usual extreme length :—20 inches, but examples have been recorded measuring at least six inches more than this.

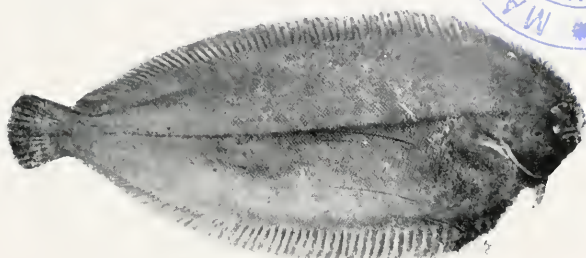
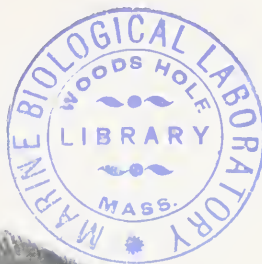
Description :—Somewhat similar to the Turbot, but lacking the characteristic bony tubercles, their place being taken by small scales. The body, moreover, is not so rounded in outline, and the fin rays are more numerous, there being seventy-six to eighty-five in the dorsal, and fifty-three to sixty-three in the anal. The coloration in life is very similar to that of the Turbot, but in the dead fish it is uniformly dark above, and white below.

The Brill spawns from March to August; like the Turbot, it preys almost entirely upon other fish.

Range :—Similar to that of the Turbot.

Remarks :—Although grouped amongst the “prime fish,” this species falls far below Turbot in market value, the cost being not greatly in advance of that of Halibut.

In flavour, the Brill is not very inferior to Turbot, but the flesh lacks that quality of firmness which constitutes one of the chief characteristics of the latter. About 20,000 cwts. are marketed annually in this country, this being roughly about one-third the quantity of Turbot. The methods of cooking are generally similar to those employed for Turbot.



No. 22. COMMON SOLE, "BEST SOLE."

Solea vulgaris, Quensel.

Also occasionally *Solea lascaris*, Risso; *S. variegata*, Donovan; and *S. azovia*, Capello, the latter from Portugal and Teneriffe.

Usual extreme length :—26 inches, the majority marketed not exceeding 12 inches.

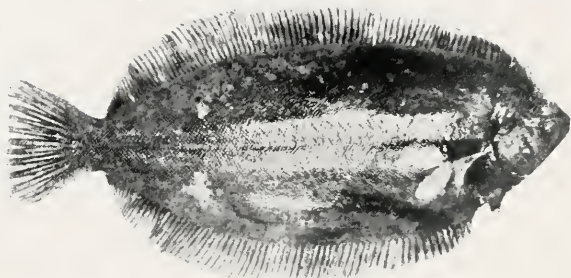
Description :—Body narrow and oval in outline; mouth situated beneath the snout; eyes on the right side; dorsal fin commencing in advance of the upper eye, and comprising 73 to 90 rays, the anal 61 to 74; pectoral fins of large size, both composed of 7 rays, the upper fin bearing a black spot at the outer end. The coloration above is brown or greenish brown, with darker blotches along the centre and at the bases of the fins; the lower surface is pure white, and on this side there are no scales on the region of the head, their place being taken by a number of short soft processes.

The Sole spawns from April to August; its food consists of marine worms, starfish, crustaceans, etc.

Range : From the South of Scotland to the Mediterranean; the species is fairly abundant in the southern area of the North Sea, Irish Sea, Bristol Channel, and English Channel.

Remarks :—The Sole is the most costly of the "prime fish," and in the trade three distinct categories of size are recognised, their value varying. The most expensive are fish of medium size; the so-called "Slip-Soles" are included under the small size, and their cost ranges about one-fifth less than that of the medium.

The methods of cooking soles are numerous, but it may be mentioned that in common with Turbot, Brill, and Halibut, the sole loses nothing of its excellent flavour by boiling, a method of preparation calculated to render other flatfish almost tasteless. From 65,000 cwts. to 70,000 cwts. are marketed annually, the heaviest landings coming from the North Sea.



No. 23. LEMON SOLE, LEMON DAB, MERRY SOLE, SMEAR DAB, etc.

Pleuronectes microcephalus, Donovan.

Usual extreme length: 16 inches.

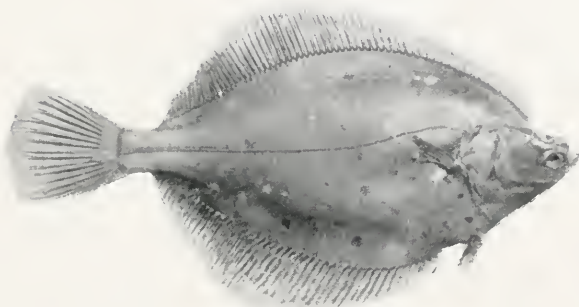
Description: Body regularly oval in outline; head and mouth of small size; scales small, and extending throughout the entire surface of the body and head, and also to the marginal fins on the upper side; 85 to 93 rays in the dorsal fin, 70 to 76 in the anal. Coloration above, warm yellowish brown with darker marblings, pure white below.

The Lemon Sole spawns from April to September; its food consists of small crustaceans and worms.

Range: From the North of Europe to the Bay of Biscay.

Remarks:—The name "Lemon Sole" usually applied to this fish is somewhat misleading, for being a *Pleuronectes*, the species bears a closer affinity to the Plaice, Dab, Flounder, etc., than to the Soles proper, which are included in the genus *Solea*; the term, moreover, is applied locally to another species, the "Sand Sole" or "French Sole" (*S. lascaris*).

The species is held in very high esteem, and is considered by many to be a fair substitute for "Best Sole." In the market its value ranges to nearly twice that of plaice, thus ranking next to that of Halibut.



No. 24. PLAICE.

Pleuronectes platessa, Linnaeus.

Also *Pleuronectes glacialis*, Pallas, from Northern waters.

Usual extreme length : 28 inches, but examples from Iceland may exceed this length; the majority of those usually marketed do not run above 15 inches.

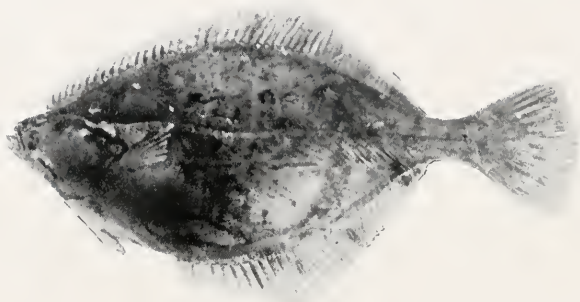
Description : Eyes situated on the right side of the body, a bony ridge extending across the upper margin of the gill-cover and between the eyes; number of fin rays similar to that of the Dab, but the smooth scales and the comparatively straight lateral line serve to distinguish the species from its smaller ally. Coloration brown, or golden brown, with a number of red or orange spots.

The Plaice spawns in the early part of the year; its food consists of shellfish, marine worms, etc.

Range : From the North Coasts of Europe and Iceland to the Bay of Biscay.

Remarks : In the market, three distinct categories of size are recognised in this important food-fish, viz. : "Large" (North Sea), 2lbs. to 3½lbs. or more, (Iceland) 3lbs. to 4lbs.; "Medium," 3lb. to 2lbs.; "Small," under 3lb. The value of these three classes differs materially, that of the medium being the highest. Small Plaice are often marketed as "Flounders." By far the greatest quantity of Plaice landed in this country comes from the North Sea, but a large supply is also derived from the White Sea, and Iceland; the Barents Sea also proves, at times, a profitable fishing ground.

The Plaice is essentially a fish for frying, either whole or in fillets, when of small or medium size. The smaller fish are excellent when prepared in spiced vinegar.



No. 25. FLOUNDER, FLUKE.

Pleuronectes flesus, Linnaeus.

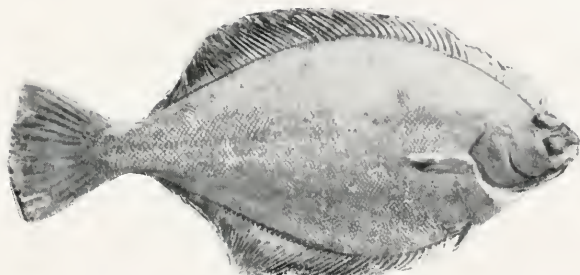
Usual extreme length: 18 inches.

Description: Somewhat similar in general appearance to the Plaice, but easily distinguishable by the following characteristics, viz:—The occurrence of a row of rough spiny processes (modified scales) at the base of the dorsal and anal fins, and around the front end of the lateral line; and the absence of tubercles on the ridge between the eyes. The former of these characteristics are more strongly developed in fish from the Baltic, and often lacking in others from the Mediterranean. The Flounder, moreover, possesses fewer fin rays than any other member of the same group, there being sixty to sixty-two in the dorsal, and thirty-nine to forty-five in the anal, a fact that appears to render the caudal fin more distinctly separated from the rest of the body than it is in the Plaice. The coloration above is very dark brown, almost black, with indistinct markings, the lower surface pure white. The eyes are usually situated on the right side, but examples in which this order is reversed are not uncommon (see figure).

The Flounder spawns from February to June.

Range:—From the Norwegian coast and the Baltic to the Mediterranean. The species affects brackish, or even fresh water, being found largely in estuaries easily accessible from the sea.

Remarks:—In the market, young Plaice are often described as Flounders. Despite the fact that the value is considerably less, the present species is preferred by many people to Plaice. It should be noted that the Flounder of this country is an entirely different fish from the American species, which is held in such high esteem in the United States.



No. 26. DAB, SAND DAB.

Pleuronectes limanda, Linnaeus.

Usual extreme length: 17 inches or slightly over.

Description: Recognisable from any other member of the right-sided group of flat fishes by the upward rounded curve of the lateral line above the pectoral fin. The skin is rough, this being due to the spines on the scales. The coloration is light brown, with small dark spots, which latter may only be seen during life.

The Dab spawns from February to July; its food consists largely of crustaceans.

Range: From the North of Norway to the Bay of Biscay; the species is abundant everywhere around the coasts of Britain.

Remarks:—Comparatively few large Dabs are to be met with in the ordinary way at the fishmonger's, but examples of small or moderate size are generally to be found among the stock of Plaice. In flavour and quality the present species is very similar to the Pole Dab and Flounder.



No. 27. WITCH, POLE DAB, POLE FLOUNDER.

Pleuronectes cynoglossus, Linnaeus.

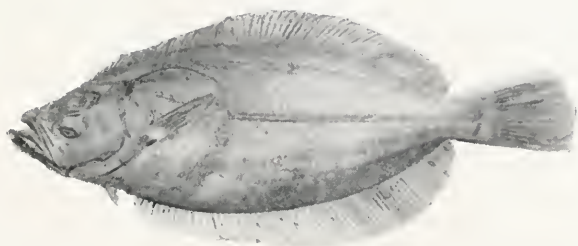
Usual extreme length: —About 16 inches.

Description : More slender in build than the Lemon Sole ; head and mouth of small size ; dorsal fin commencing behind the eye ; lateral line almost straight ; fin rays numerous, 102 to 115 in the dorsal, and 86 to 97 in the anal ; scales slightly rough on the upper surface of the body, smooth below. The coloration above is pale brown, impure white below.

The Witch spawns from May to September.

Range : From the North of Europe to the Bay of Biscay, and from Greenland to Cape Cod. The species is not common in the English Channel, but fairly abundant in the North Sea and elsewhere around Britain.

Remarks:—The Witch bears a certain superficial resemblance to the Lemon Sole, to which species both in flavour and quality it is certainly inferior. Its market value slightly exceeds that of plaice, but as a food fish it approximates more nearly to Megrin than to any other member of the present group.



No. 28. MEGRIM, SAILFLUKE, WHIFF.

Lepidorhombus megastoma, Donovan.

Usual extreme length:—About 20 inches.

Description: Eyes on the left side, head and mouth of large size, the body itself narrow and thin. Dorsal fin commencing in advance of the upper eye; lateral line exhibiting a sharp upward curve above the pectoral fin. The scales, which are large and spinous, are easily detached; in an allied species, the Scald-Back, the slightest handling denudes the body of both scales and skin. The coloration, in examples of small or moderate size, is pale brownish yellow without distinct markings; in large specimens there are sometimes present indistinct patches of darker mottling.

The Megrime spawns from February to May; its food consists largely of small fish and crustaceans.

Range:—Essentially a deep-water fish, the Megrime occurs from the North of Norway and Iceland to the Bay of Biscay. It is not common in the North Sea, but abundant on the West of Scotland and the South of Ireland.

Remarks:—The quantity of Megrime landed in Britain of recent years has shown a steady increase, the species being one of those less well-known flatfishes which are gradually gaining in popular esteem. The species is sometimes described by that somewhat expansive designation, "Lemon Sole," but although of very fair edible quality, it cannot compare either in quality or market value with the fish legitimately described by that name.

The somewhat curious synonym, "Sailflake," has been given to the species on account of the popular belief that the fish scuds on the surface of the sea in the presence of a high wind, erecting its tail to act as a sail.



No. 29. HERRING.

Clupea harengus, Linnæus.

Usual extreme length :— Slightly above 12 inches, but examples have been recorded measuring 17 inches.

Description :— Dorsal fin commencing midway between the end of the snout and the base of the tail; ventral fins rooted on a line a little behind the commencement of the dorsal; scales of moderate size, easily detached. Coloration blue green above, the sides brilliantly iridescent.

The food of the herring consists of the free-moving organisms of the sea (Plankton). Several distinct races of this important fish are now recognised, which differ in their habits more particularly as regards the time and place of spawning, those which deposit their eggs in winter frequenting brackish waters, whilst the summer-spawning fish are less coastal during the breeding season. Both varieties, however, frequent the upper strata of the sea, and undertake inshore migrations prior to and during the process of reproduction.

Range : From the White Sea to the Bay of Biscay. So far as the British Isles are concerned, the heaviest landings are those of autumn herrings at Yarmouth, Lowestoft, and North Shields. At the two former ports, the larger quantities are marketed from July to December, whereas at the last-named place, together with Blyth and Hartlepool, the heavier landings occur somewhat earlier in the year, and diminish rapidly before the end of November. The majority of herring marketed in this country are caught by means of drift nets, but a profitable fishery is also prosecuted, by means of the trawl, upon fish situated *presumably* in their permanent quarters on the sea-bed.

Remarks :— It is a remarkable fact that less than one quarter of the Herrings landed in this country are for home consumption: the remainder, in some form or another, are exported to various foreign countries.

It is to be regretted that many Continental methods of converting this inexpensive fish into special forms of delicacy are practically neglected in this country. The species, however, when salted or smoked, and retailed as "Kippers," "Ham-cured" or "Red Herrings," and "Bloaters," forms the subject of the largest dried fish trade in these islands. In its young stages, the Herring, from an economic standpoint, is very closely connected with the Sprat, and often forms a very large component of a sample of Whitebait, a collective term used to designate a gathering of the young of certain kinds of fish, and which may sometimes include such widely different species as Sand-Eels, Pipefish, Gobies, and Scad.



No. 30. PILCHARD, SARDINE.

Clupea pilchardus, Linnæus.

Usual extreme length : 14 inches, but the majority do not exceed 10 inches.

Description : Dorsal fin situated nearer to the snout than the base of the tail, ventral fins rooted on a line behind the commencement of the dorsal; scales of large size; edge of the belly rounded, the spines occurring on it weak; radiating lines beneath the eye and on the gill-cover. Coloration dark olive green above, silvery on the sides, but not so brilliantly iridescent as in the Herring. The young often have a row of indistinct black spots on the flanks.

The Pilchard spawns from June to October; its food is similar to that of the Herring.

Range : A pelagic and migratory fish, the Pilchard ranges from the South coast of these islands to Madeira and throughout the Mediterranean. The most productive fishery is generally prosecuted off the coast of Cornwall, but of recent years the species has shown a marked tendency to extend its migrations farther to the east.

Remarks : Although the Pilchard in the fresh state may not be regarded as an important food fish in this country, it is a species of considerable economic importance in forming the subject of an extensive drift fishery in the West of England. The product is, for the greater part, salted for export to certain southern countries, notably Italy, where the Pilchard enjoys the same popularity as does the Herring similarly cured in this country.

A more important use for the fish in its younger stages has existed for many years past in France and Portugal, where the canning industry, *i.e.*, the manufacture of Sardines in Oil, absorbs the greater part of the supply. So far as this country is concerned, the salt curing process is the most important, but, nevertheless, "Cornish Sardines," "Pilchards in Oil," and "Pilchards in Tomato Sauce" obtain a small market.

Outside Devon and Cornwall the species is seldom marketed in a fresh state, owing to the fact of its rapid deterioration in transport, but residents in the West make extensive use of the fish, a favourite method of preparation for the table being by "sousing" or pickling in spiced vinegar.



No. 31. SPRAT.

Clupea sprattus, Linnaeus.

Usual extreme length :— $6\frac{1}{2}$ inches, the majority not exceeding 5 inches.

Description : Dorsal fin commencing a little behind the point midway between the end of the snout and the root of the tail, the bases of the ventrals being slightly in advance of the front of the dorsal. Edge of the belly sharply keeled and spinous, presenting an appearance like the cutting edge of a fine saw. No radiating lines on the gill-covers as in the Pilchard. Coloration above not so distinctly blue-green as in the Herring, but the sides equally brilliant.

The spawning period is prolonged, extending over the first six months of the year according to the locality. The food consists of the minute moving organisms of the sea (Plankton).

Range :—From the North of Europe to the Mediterranean. The Sprat is a migratory fish, spawning at some distance from land, and returning to brackish water some time afterwards. The young, known as "Britt," are met with in large numbers in estuaries, where they form a large component of the catch of Whitebait. (See also under Herring).

Remarks :—The Sprat is essentially a longshoreman's fish, vast numbers being taken in shallow water in seines, stow-nets, and drift-nets of small mesh during the season, which so far as the London markets are concerned, extends from October to the end of January. The Thames estuary supports a most profitable fishery from the standpoint of productiveness, but in common with other fishes which occasionally form a glut in the market, the Sprat is of very slight value commercially.

It is a fish well adapted for manufacturing purposes; "smoked sprats," retailed at a modest price per bundle, are preferred by many to the fresh fish. The so-called "Norwegian Sardines," however, are, perhaps, the best instance of the conversion of this abundant and low priced fish into a useful commodity of diet.



No. 32. MACKEREL.

Scomber scomber, Linnæus.

Usual extreme length :—20 inches, but the majority seldom attain more than 14 inches.

Description : Body torpedo-shape; two separate dorsal fins of moderate size, the second, together with the anal, followed by a series of five or six small finlets; caudal fin deeply cleft, a small keel occurring on either side of its base. Coloration green or blue green above, shading rapidly away to silvery white with iridescent reflections; a number of vertical irregularly wavy bars of black across the back.

The Mackerel spawns from May onward; its food consists of the minute moving organisms of the sea (Plankton), larger free swimming crustaceans, etc., and young fishes.

Range :—From the South of Scandinavia to Madeira and throughout the Mediterranean. In English waters the species occurs abundantly in the Channel, and up to the Norfolk coast. The Mackerel is a migratory fish, feeding at the surface during the summer months, and retiring to greater depths on the approach of winter.

Remarks :—The summer drift fishery and the winter trawl fishery are subject to considerable fluctuation, but the Mackerel may, nevertheless, be regarded as one of our most important food fishes. The flesh is liable to somewhat rapid deterioration, especially at the height of the summer season, and few people living in inland towns are able to appreciate the excellent qualities of the freshly-caught fish.

The Mackerel lends itself well to a variety of methods of table preparation, equally good results being obtained by baking, gridding, frying in fillets, or boiling. Marinated or pickled Mackerel, especially if white wine vinegar be used in preparation, forms an excellent dish.

Despite its near affinity to the Tunny, the Mackerel does not appear to lend itself so well to the process of canning as do certain other pelagic fishes, but a small industry of this character exists in this country; during the slack season, moreover, the French Sardine manufacturers pack a fair number of small fish in oil. In a salted or otherwise cured condition the Mackerel forms the subject of a fairly extensive export trade, about 100,000 cwts. having of late years been sent annually to the United States of America. Of recent years smoked Mackerel have gained a fair market in these islands.



No. 33. SMELT, CUCUMBER SMELT, SPARLING.

Osmerus eperlanus, Linnaeus.

Usual extreme length:—12 inches.

Description: Body somewhat attenuated, tapering gently to a deeply forked caudal fin. Mouth of fair size, armed with large teeth, the gape extending to the hinder edge of the eye. Two dorsal fins, the second of small size and adipose. Coloration above, varying from pale sea-green to very light brown, the sides brilliantly iridescent with roseate reflections.

The Smelt spawns in March, April, and May, in situations where the water is fresh or very nearly so; its food consists chiefly of small fishes and crustaceans.

Range: An essentially estuarine fish occurring at the mouths of rivers in Northern Europe and America. In certain places the species occurs in land-locked water, but examples found in such situations do not attain to the size of those of normal habitat.

Remarks: The Smelt proper is a salmonoid fish, and an entirely distinct species from the Atherine, which in many places is netted in some quantity and marketed under the name of "Sand Smelt." Strictly speaking, therefore, it should not be included in the category of Sea Fish. The freshly caught fish emit a pleasing smell, which has not inaptly been likened to that of cucumber. The flavour and quality generally are excellent, fried Smelts possessing a characteristic flavour unlike that of any other fish. An excellent, though comparatively unknown, method of cooking this fish consists in splitting them open, and after preparing in egg and bread-crumbs as in the case of Soles, frying in fat.



No. 34. DOG FISH.

Smooth Hound, *Mustelus vulgaris*, Willughby.

Nurse, *Scyllium catulus*, Linnæus.

Huss, *Scyllium caniculus*, Linnæus.

Spur Dog, *Acanthias vulgaris*, Risso (see figure).

Usual extreme length :—The first of the above species, the Smooth Hound, attains a length of about 6 feet; the second, the Nurse Hound, 5 feet; whilst the other two, the Huss, or Lesser Spotted Dog, and the Spur Dog, seldom exceed $3\frac{1}{2}$ feet.

Description: The term “Dogfish” is used in the market to designate several minor members of the Shark family. All the species agree in the following characteristics, amongst others:—Skeleton cartilaginous; body invested with a tough skin, which is often rough and always devoid of scales; lobes of the tail unequal, the vertebral column passing into the upper; the mouth, situated on the under surface of the body, is plentifully provided with formidable teeth; instead of the single gill opening situated on either side of the head, as in the bony fishes hitherto described, there are several gill-slits of small size.

The **Smooth Hound**, as its name implies, is lacking in the spinous surface to the skin; its coloration is blue grey, lighter below, and with or without spots.

The **Nurse** is brownish or reddish grey in colour, with large spots and blotches of a darker tint. In this species the anal fin ends in a line under the middle of the second dorsal.

The **Huss** is somewhat similar in appearance to the Nurse, but may be distinguished by the fact that the anal fin ends under the space between the two dorsals.

The **Spur Dog** which is known also amongst the fishermen as “Sweet William,” may be distinguished from any of the preceding by the presence of a spine in the front of each dorsal fin, and by the absence of an anal fin.

Remarks: Within the past eight years the quantity of Dogfish marketed in this country has more than trebled, and the value has shown a steady increase. This is largely due to the fact that, with the decreased landings of the better classes of fish, there is a greater demand amongst the frying trade for those essentially wholesome fishes which but a few years ago were practically unsaleable, largely as the outcome of popular

prejudice. There can be little doubt that Dogfish, or "Flake," as it is often called, can be rendered quite palatable, if care is exercised in cooking, and it is much to be regretted that the market is still so small. A good method of cookery consists in frying in fillets.

The Dogfish, especially the commonest species (Spur Dog), constitutes at times a serious menace to certain drift fisheries by the damage it causes to the nets and enmeshed fish, and it is therefore highly desirable that its market value should advance to such a standard that a regular fishery could be prosecuted.

The various species are either viviparous, or bring forth the ova enclosed in horny pouches, the so-called "Mermaids' Purses"—facts which serve to maintain a plentiful supply of these comparatively undesirable fishes.



No. 35. SKATES and RAYS.

Several species of the Genus *Raia*.

Usual extreme length: The *Common Skate* (see figure), known also as "*Roker*," attains a length of 7 feet or more, but the majority of the other species are considerably smaller.

Description :—All the Skates and Rays agree in having the body compressed from above and below, the eyes thus maintaining a normal position on the upper surface of the body. In this

respect they differ from the Flat fishes, in which the body is laterally compressed. The peculiarly broad form of the body itself is due to the enormous development of the breast fins, the tail being correspondingly reduced, and forming an attenuated appendage upon which the two dorsal fins are placed. The breast fins extend nearly to the tip of the snout, passing over the gill-slits, which are situated on the lower surface of the body and below the mouth. Where scales are present, they take the form of more or less strongly developed spines, which in some species are confined to certain portions of the upper surface of the "wings," as the breast fins are termed. The skeleton, as in the case of the Dogfish, is cartilaginous. The coloration of the various species is generally admirably in keeping with the mode of life of these fishes, approximating in tone very nearly to that of the sea-bed.

As in the case of certain of the Dogfish, the members of this group produce their eggs each enclosed in a horny envelope (Mermaids' Purses). Their food consists chiefly of crustaceans and molluscs, which are secured by the fish swimming directly over its prey, covering it with its body, and then by a special movement conveying it to its mouth.

Range: The several species are more or less common in distribution around these islands, certain occurring more abundantly in the North, others being practically confined to the Southern area.

Remarks: The greatest supply of Skates and Rays comes from the Western area of the English Channel and the adjacent waters. The market value is not considerable, but the skate is held in some esteem, especially amongst the poorer classes. The somewhat glutinous nature of the flesh, a characteristic which is heightened by the presence of cartilaginous bones, appears to require a cultivated taste for its full appreciation. Skate is often prepared for the table by boiling, but frying is perhaps preferable.

In the market, the entire fish is seldom seen, the portions retailed being the "wings," which have been previously skinned.



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